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Phase II of SRS Dose Reconstruction Project Begins

Phase II of the Savannah River Site (SRS) Environmental Dose Reconstruction Project will evaluate releases of radioactive materials and chemicals from the SRS to the surrounding environment. *Radiological Assessments Corporation (RAC)* has recently been awarded a contract from the Centers for Disease Control and Prevention (CDC) to evaluate these releases.

Phase I of the SRS Dose Reconstruction Project was completed in June 1995. Phase I, also conducted by *RAC*, involved searching the Site to identify and retrieve significant documents that

The source term for a chemical or radionuclide describes how much, when, where, and in what form the material was released.

could be used for the dose reconstruction task. Phase II will use this and other information to calculate chemical and radiological source terms

and identify possible intake pathways (eating, drinking, and inhalation) for people who lived in the SRS area.

Phase II of the dose reconstruction process involves a number of tasks. One of the most important is calculating source terms for chemical and radiological releases.

Estimating Past Releases

The source term describes the characteristics of a chemical or radionuclide release into the environment. These characteristics include the type of material released, release location, quantity of material, and the history of the material released. Developing a source term involves estimating the release amounts and the associated uncertainties.

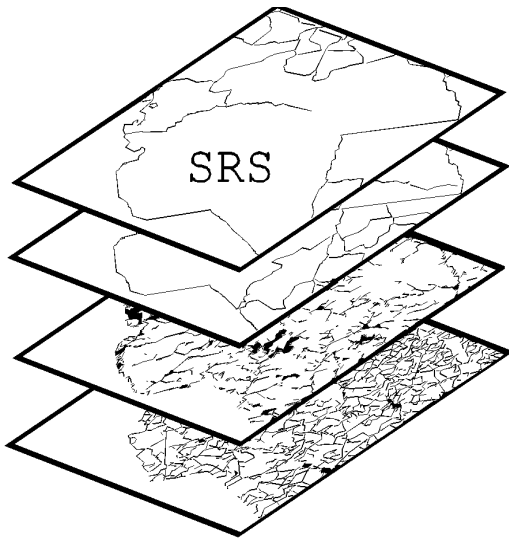
Determining the source term is simplified if releases of all hazardous materials are well documented, but this is often not the case, especially for the early years. Large-scale production, which began at the SRS in the 1950s, involved releases of contaminants to offsite locations that were not monitored in all cases. Accounting for accidental and unmonitored releases makes developing a source term more difficult.

The main objective of the Phase II study is to estimate source terms for all significant chemical and radionuclide releases, accidental or routine.

Identifying Release Pathways

The CDC also set a Phase II goal of identifying possible pathways to offsite residents from toxic materials releases.

To identify intake pathways, population dynamics, agricultural practices, and lifestyle patterns of residents of the SRS area must be understood. Ingestion pathways (eating and drinking) are affected not only by these factors, but also by environmental variables that may impact crop yield or change the consumption of wild game and fish. Many possible scenarios can arise with each change in these variables, and RAC must identify the key data necessary to set up reasonable exposure scenarios.



Sample Geographic Information System output maps showing population density, crop production, and major streams located in the SRS area.

How Will So Much Information Be Stored?

Important data will be stored in a relational demographic database, which links different sets of data. Each individual set of data is important, but the goal is to link the information to provide a profile of the areas and populations potentially affected by releases from the Site.

This database will include geographic information about land use and ground water. These data will assist in assessing potential pathways significant for chemical and radionuclide transport to human populations.

A Geographic Information System will use the data collected to create maps of key information and relationships. These data will be used to develop maps of doses and risks to the offsite population later in the study.

Evaluating Environmental Information

Evaluating environmental data is critical to checking source term calculations and developing the database. The nature and quality of the records of offsite measurements will determine their value and usefulness in the completing the Phase II tasks. Data quality will be assessed by determining the circumstances under which samples were collected and evaluating the method of collection and analysis. This assessment will help establish uncertainty values for the data, which will be used to check source term calculations.

Clarifying Ranges for Uncertainty

Uncertainty is an important consideration in any scientific evaluation. Uncertainty analysis quantifies the level of confidence researchers have in the final results.

The results of the source term study will be determined and reviewed with a great deal of care. However, uncertainty will always be associated with release estimates because of uncertainty in data collection, analysis, and other factors associated with the original data. This uncertainty cannot be removed from the source term calculation, but if carefully evaluated, a best estimate and a range for each hazardous release can be obtained from the data available.

Other Tasks

Other tasks of Phase II include internal and external reviews of key research, continual update of document records as new sources are discovered, and quality assurance.

An Open, Public Process

Public input and RAC's promise to provide clear and easily obtained information are critical to this project from start to finish. Newsletters and fact sheets will be published regularly to provide updates on the progress of the research and highlight specific research topics. Public meetings will be held in the SRS area and will be announced on the mailing cover of each newsletter. These public meetings, presented by

RAC and CDC staff and scientists, will offer more specific research information.

Detailed technical information, including copies of the Phase I database describing all research material discovered through June 1995, is also available upon request.

RAC is committed to performing open, high quality work and seeks information, questions, and ideas from the public. An address for inquiries and comments is located on the outside cover of this newsletter. We encourage your input to our work and your attendance at our meetings to stay informed on the progress of RAC's research.

So Many Chemicals . . . A Method to Evaluate SRS Chemical Releases

Thousands of chemicals have been used at the SRS. A list of potential chemicals of concern has been developed. This list is based on published inventories; a worker-right-to-know database maintained by the Worker Health and Safety Department at the Site; interviews of current and former Site employees; documents containing lists of essential materials; reports

describing processes involving chemicals; and documents containing information on spills, leaks, accidents, and other events that released chemicals into the environment.

The chemicals will be evaluated and ranked according to their potential for offsite release and ability to cause adverse health effects. Factors that will be considered in ranking the chemicals include the amount of material kept and used onsite; the chemical's toxicity potential to cause cancer, reproductive effects, and birth defects; and the chemical's mobility in the environment. The ranking will be useful in identifying materials that should receive priority when developing the source term.

*Chemicals used at the SRS
will be ranked considering
the amount available, potential for
release, and relative hazard.*

PUBLIC WORKSHOPS

Savannah River Site Environmental Dose Reconstruction Project

conducted by

The National Center for Environmental Health, Centers for Disease Control and Prevention, and
Radiological Assessments Corporation

Wednesday, February 14, 1996, 7-9:00 pm

Holiday Inn Express

1350 Whiskey Rd., Aiken (I-20, Exit #18, Hwy. 19S)
803-648-0999

Thursday, February 15, 7-9:00 pm

Savannah DeSoto Hilton

15 East Liberty Street, Savannah
912-232-9000

The SRS Environmental Dose Reconstruction Project will evaluate releases of radioactive materials and chemicals from the SRS to the surrounding environment. Phase I of the project involved searching the Site to identify and retrieve important documents that could be used for the dose reconstruction task. Phase II will use this and other information to calculate chemical and radiological source terms and identify possible intake pathways (eating, drinking, and inhalation) for people who lived in the SRS area.

Radiological Assessments Corporation scientists will discuss plans and progress, including methods being used to develop source term data (chemical and radionuclide release information).

Workshops are open to the public for observation and comment, limited by space available. The meeting rooms will accommodate approximately 50 people. Parking fees will be waived for those attending public workshops.

For more information, call Mr. Paul Renard, Project Manager, Centers for Disease Control and Prevention (770-488-7040).

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